

## WHAT IS CLAIMED IS:

1           1.     For use in a wireless network comprising a plurality of  
2     base stations, each of said base stations capable of communicating  
3     with a plurality of mobile stations, a mobile station diagnostic  
4     testing system capable of testing the operation of a first one of  
5     said plurality of mobile stations comprising:

6                 a database capable of storing a mobile station diagnostic  
7     testing file comprising a mobile station diagnostic testing program  
8     in interpreted byte-code format; and

9                 a diagnostics controller coupled to said database capable  
10    of receiving a notification indicating that a fault has occurred in  
11    said first mobile station and further capable, in response to  
12    receipt of said notification, of retrieving said mobile station  
13    diagnostic testing file from said database and transmitting said  
14    mobile station diagnostic testing file to said first mobile  
15    station, wherein receipt of said mobile station diagnostic testing  
16    file causes said mobile station to execute said mobile station  
17    diagnostic testing program in said mobile station diagnostic  
18    testing file.

1           2.    The mobile station diagnostic testing system as set forth  
2    in Claim 1 wherein said mobile station diagnostic testing file  
3    further comprises diagnostics data used to test said first mobile  
4    station.

1           3.    The mobile station diagnostic testing system as set forth  
2    in Claim 1 wherein said mobile station diagnostic testing file is  
3    transmitted to said mobile station using TCP/IP packets.

1           4.    The mobile station diagnostic testing system as set forth  
2    in Claim 1 wherein said mobile station diagnostic testing file is  
3    transmitted to said mobile station using at least one short  
4    messaging service (SMS) message.

1           5.    The mobile station diagnostic testing system as set forth  
2    in Claim 1 wherein said diagnostics controller is capable of  
3    determining from said notification a model type of said first  
4    mobile station and, in response to said determination, selecting  
5    said mobile station diagnostic testing program according to said  
6    model type.

1           6.    A mobile station capable of being tested from a wireless  
2 network by an over-the-air (OTA) mobile diagnostic testing process,  
3 said mobile station comprising:

4                an RF transceiver capable of receiving and demodulating  
5 forward channel messages from said wireless network and further  
6 capable of modulating and transmitting reverse channel messages to  
7 said wireless network; and

8                a main controller capable of receiving said demodulated  
9 forward channel messages from said RF transceiver and extracting  
10 therefrom a mobile station diagnostic testing file containing a  
11 mobile station diagnostic testing program in interpreted byte-code  
12 format, wherein said main controller, in response to receipt of  
13 said mobile station diagnostic testing file, is capable of  
14 interpreting and executing said mobile station diagnostic testing  
15 program.

1           7.    The mobile station as set forth in Claim 6 wherein said  
2 mobile station diagnostic testing file further comprises diagnostic  
3 testing data and wherein said main controller uses said diagnostic  
4 testing data to test said mobile station.

1           8.    The mobile station as set forth in Claim 6 wherein said  
2   mobile station diagnostic testing file is transmitted to said  
3   mobile station in said forward channel messages using TCP/IP  
4   packets.

1           9.    The mobile station set forth in Claim 6 wherein said  
2   mobile station diagnostic testing file is transmitted to said  
3   mobile station in said forward channel messages using at least one  
4   short messaging service (SMS) message.

1           10.   The mobile station as set forth in Claim 6 wherein said  
2   mobile station diagnostic testing program comprises a graphical  
3   user interface (GUI) program capable of interacting with a user of  
4   said first mobile station during said OTA diagnostic testing  
5   process.

1           11. The mobile station as set forth in Claim 6 wherein said  
2 main controller is capable of transmitting to said wireless network  
3 a reverse channel notification message notifying said wireless  
4 network that a fault has been detected in said mobile station,  
5 wherein receipt of said reverse channel notification message is  
6 capable of causing said wireless network to transmit said mobile  
7 station diagnostic testing file to said mobile station.

1           12. The mobile station as set forth in Claim 11 wherein said  
2 reverse channel notification message comprises an identifier  
3 identifying a model type of said mobile station.

1           13. For use in a wireless network comprising a plurality of  
2 base stations, each of the base stations capable of communicating  
3 with a plurality of mobile stations, a method of testing the  
4 operation of a first one of the plurality of mobile stations  
5 comprising the steps of:

6           storing in a database a mobile station diagnostic testing  
7 file comprising a mobile station diagnostic testing program in  
8 interpreted byte-code format;

9           receiving a notification indicating that a fault has  
10 occurred in the first mobile station and further capable;

11           in response to receipt of the notification, retrieving  
12 the mobile station diagnostic testing file from the database;

13           transmitting the mobile station diagnostic testing file  
14 to the first mobile station; and

15           in response to receipt of the mobile station diagnostic  
16 testing file in the mobile station, executing in the mobile station  
17 the mobile station diagnostic testing program in the mobile station  
18 diagnostic testing file.

1           14. The method as set forth in Claim 13 wherein the mobile  
2           station diagnostic testing file further comprises diagnostics data  
3           used to test the first mobile station.

1           15. The method as set forth in Claim 13 wherein the step of  
2           transmitting comprises the sub-step of transmitting the mobile  
3           station diagnostic testing file to the mobile station using TCP/IP  
4           packets.

1           16. The method as set forth in Claim 13 wherein the step of  
2           transmitting comprises the sub-step of transmitting the mobile  
3           station diagnostic testing file to the mobile station using at  
4           least one short messaging service (SMS) message.

1           17. The method as set forth in Claim 13 further comprising  
2           the step of determining from the notification a model type of the  
3           first mobile station and, in response to the determination,  
4           selecting the mobile station diagnostic testing program according  
5           to the model type.

1 18. For use in a mobile station capable of communicating with  
2 a wireless network, a method of performing an over-the-air (OTA)  
3 diagnostic testing of the mobile station from the wireless network  
4 comprising the steps of:

5 receiving and demodulating forward channel messages from  
6 the wireless network;

7 extracting from the demodulated forward channel messages  
8 a mobile station diagnostic testing file containing a mobile  
9 station diagnostic testing program in interpreted byte-code format;  
10 and

11 interpreting and executing the mobile station diagnostic  
12 testing program.

1 19. The method as set forth in Claim 18 wherein the mobile  
2 station diagnostic testing file further comprises diagnostic  
3 testing data used to test the mobile station.

1 20. The method as set forth in Claim 18 wherein the forward  
2 channel messages comprise TCP/IP packets.



1           21. The method as set forth in Claim 18 wherein the forward  
2 channel messages comprise at least one short messaging service  
3 (SMS) message.

1           22. The method as set forth in Claim 18 wherein the mobile  
2 station diagnostic testing program comprises a graphical user  
3 interface (GUI) program capable of interacting with a user of the  
4 mobile station during the OTA diagnostic testing process.

1           23. The method as set forth in Claim 18 further comprising  
2 the steps of:

3           transmitting to the wireless network a reverse channel  
4 notification message notifying the wireless network that a fault  
5 has been detected in the mobile station; and

6           in response to receipt of the reverse channel  
7 notification message transmitting the mobile station diagnostic  
8 testing file to the mobile station from the wireless network.

1           24. The method as set forth in Claim 23 wherein the reverse  
2 channel notification message comprises an identifier identifying a  
3 model type of the mobile station.